IV. COMMODITY FIRM FINANCING, CAPITAL STRUCTURE, AND OWNERSHIP

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IV. COMMODITY FIRM FINANCING, CAPITAL STRUCTURE, AND OWNERSHIP

SUMMARY

A CTF’s capital structure depends on the scale of its operations and the size of its asset base. Leverage for the largest, most asset-heavy CTFs is similar to non-financial US corporations. Other CTFs are more highly leveraged but much less leveraged than banks.

CTFs’ balance sheets are structured differently from banks. In general, short-term assets are funded with short-term debt and long-term assets with long-term funding.

Historically, banks have been major suppliers of credit to CTFs. Fears that reduced bank funding would destabilize markets appear unfounded so far. However, bank funding may be more restricted in future. This may increase concentration in commodity trading, but the impact on trading volumes will be limited.

Smaller firms are all privately owned. Private ownership aligns incentives between managers and equity owners.

Some larger, more asset-heavy CTFs are publicly listed. They may require large-scale equity investments that exceed the capacity of a small group of owner-managers. Public listing allows firms to transfer risks to diversified investors.

Broader market developments, including the wider availability of information, are causing some firms to become more asset-intensive. This will put increasing pressure on the private ownership model.

CTFs also act as financial intermediaries for their customers through complex transactions that bundle financing, risk management and marketing services. Common structures include trade credit agreements, prefinancing, commodity prepays and tolling arrangements. Banks and other financial institutions remain, overwhelmingly, the ultimate source of credit. CTFs act as conduits between these financial institutions and their customers.

A. THE FINANCING OF COMMODITY TRADING FIRMS

Like all firms, commodity traders need to finance their operations. Their choices of funding strategies—their capital structures—influence the efficiency of their operations, and are crucial determinants of their ability to withstand economic shocks. Moreover, since the debt and equity issued by commodity trading firms connects them to the broader financial system, capital structure also determines the vulnerability of trading firms to financial market conditions—including financial crises—and the influence of commodity trading firms (and hence commodity market conditions) on the stability of the broader financial markets.

An examination of the available information on the financing of commodity trading firms indicates that the diversity of commodity trading firm business strategies is mirrored in the diversity of their financing strategies. Firms differ in their gearing/leverage; the forms of leverage that they employ; and their ownership of their equity. Moreover, these differences in financing strategies co-vary with the kinds of transformations that firms undertake: firms that are more physical asset intensive finance themselves differently than firms that are engaged in more traditional pure trading activities. Relatedly, as the business strategies of trading firms are evolving, their financing strategies are evolving as well.

Financial statement information available for some of the largest trading firms illustrates these points. I start by looking at the leverage of trading firms.

One measure of total leverage is total assets divided by book value of equity. Table 1 presents this measure for 2012 for 18 trading firms for which data are available. This ratio ranges from 2.38 (ADM) to 111 (E.On Global). The average (which is somewhat misleading, due to the presence of the outlier E.On) is 18, and the median is 4.

This measure of overall leverage of commodity trading firms is somewhat higher than non-financial corporations in the United States. As of the end of the third quarter, 2013,
the ratio of assets to equity for such corporations was 2.06.1 The more asset-heavy firms (e.g., Cargill, ADM, Bunge) have leverage ratios that are similar to those for the US non-financial corporations as a whole: the more asset-light firms are more heavily leveraged. Moreover, as will be discussed in more detail below, the heavier leverage of the more traditional trading firms is somewhat misleading. Much of this debt is short-term and associated with liquid, short-term assets. The net debt of these firms (total debt minus current assets, which is a better measure of their true leverage) is quite low.

Notably, trading firms are much less highly leveraged than banks, to which they are sometimes compared: some have argued that commodity trading firms should be subject to regulations similar to banks. Specifically, for US banks that have been designated Systemically Important Financial Institutions (“SIFIs”), the mean leverage is 10.4 and the median is 10. For European SIFI banks, the mean is 20.6 and the median is 22.5.

There is a relationship between the leverage of commodity trading firms and characteristics of the asset side of their balance sheets. In particular, there is a strong correlation between the fixed asset intensity of commodity trading firms, and their leverage: more fixed asset (long term asset) heavy firms tend to be less leveraged. For 2012, the correlation between the ratio of fixed assets to total assets and the ratio of total assets to book value of equity (leverage) is -.55. Thus, trading firms that are asset heavy tend to be less heavily leveraged than those that are asset light. Put differently, pure trading firms that own relatively few fixed assets tend to be more highly leveraged than firms that also engage in processing or refining transformations that require investments in fixed assets.

The structure of the liabilities of commodity trading firms is somewhat distinctive, and also co-varies with the structure of the asset side of their balance sheets. Specifically, short-term liabilities dominate the balance sheets of trading firms. For the 17 firms in the sample, the average of the ratio of current liabilities to total liabilities is .75: the median is .70. There is considerable variation in this ratio across firms: the minimum is .36 and the maximum is 1.00. Furthermore, there is a strong correlation between this ratio and firms’ fixed asset intensity. Specifically, the correlation between the ratio of current to total liabilities and the ratio of fixed (or long term) assets to total assets is -.51. Thus, firms engaged in more fixed asset intensive transformations (such as processing) have a greater proportion of long-term liabilities. There is therefore an alignment between the asset and liability structures of commodity trading firms’ balance sheets.

Available balance sheet information also indicates that commodity trading firms do not engage in maturity transformation as do banks. Indeed, to the extent that commodity trading firms engage in maturity transformation, it is the reverse of the borrow short-lend long transformation that makes bank balance sheets fragile, and which makes banks (and other financial intermediaries) subject to runs and rollover risk. Specifically, for all 17 of the commodity trading firms studied, current assets exceed current liabilities. The median ratio of current assets to current liabilities is 1.26. Consequently, one measure of net debt (total liabilities minus current assets) is negative for 8 of the 17 firms. Furthermore, the median

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1 Board of Governors, Federal Reserve Board, Financial Accounts of the United States, Table B.102. 9 December, 2013.

This calculation is based on historical cost data, which makes it more comparable to the accounting data used to determine leverage for trading firms. Based on market values/replacement costs of non-financial assets, the ratio is somewhat smaller: 1.75. Since market values or replacement costs of trading firm assets are not available, I cannot calculate an analogous figure for them.
ratio of net debt to shareholder equity is very small, taking the value of .014. Since commodity trading firm current assets (primarily hedged inventories and trade receivables) tend to be highly liquid and/or of high credit quality (as is documented below) these figures strongly suggest that as a whole, commodity trading firms run far less liquidity risk than do financial intermediaries like banks or shadow banks.

In sum, the data show an alignment between the nature of the transformation activities firms engage in, and their funding strategies. Short-term assets are funded with short-term debt, and long-term assets are funded with long-term debt. The data also show that commodity trading firms are not heavily leveraged overall, and that their balance sheets are not fragile (i.e., subject to liquidity or rollover risk).

B. THE LIABILITY STRUCTURES OF COMMODITY TRADING FIRMS

The foregoing conclusions are reinforced when one evaluates the specifics of commodity trading firm financing. In particular, there is a close connection between the nature of transformation activities, and how they are financed.

Consider, for instance, the financing of most short-term arbitrages involving spatial transformation, storage, and blending. Firms rely extensively on bank borrowings to finance these transformation activities. In particular, they engage in large amounts of relatively short-term borrowings, including borrowings through unsecured credit lines arranged with banks, frequently through syndication arrangements. Moreover, they typically maintain bilateral credit lines with banks that can be drawn upon to fund the purchase of commodities and the issuance of credit instruments, such as letters of credit, utilized in the merchandising of commodities. These are generally used to finance each transaction at 100% of collateral values, and are marked to market periodically (e.g., weekly, or more often during periods of large price movements). They are referred to as “self-liquidating” because they are repaid upon the receipt of payments from the purchasers of the commodity. Given that these borrowings are secured by commodities that are often saleable in liquid markets, marked to market, and hedged, and that these exposures have relatively short maturities, they present less credit risk to the lending banks than unsecured credit, or credit secured by less liquid collateral.

In the past decade, some commodity trading firms have also arranged non-traditional short-term financings that could be characterized as “shadow bank” transactions. These include the securitization of inventories and receivables, and inventory repurchase transactions. Borrowings secured by inventories pose limited credit risk to the lender, especially to the extent that these inventories are in relatively liquid commodities (e.g., deliverable aluminum held in an LME warehouse) and are located in jurisdictions where there is little risk of perfecting legal title; borrowings secured by less liquid commodities, and in some jurisdictions, pose greater risks. Commodity receivables that back some securitization structures historically have exhibited very low rates of default, and rates of default did not rise appreciably even during the 2008-2009 crisis period. Moreover, these structures do not generally exhibit the maturity mismatches that contributed to runs on the liabilities of some securitization vehicles during the financial crisis. Indeed, in some of these structures, the liabilities have longer maturities than the underlying assets, meaning that the challenge they face is replenishing the assets, rather than rolling over the liabilities.

These non-bank financing vehicles may become increasingly important because broader financial trends may constrain the availability of, and raise the cost of, traditional sources of transactional financing. Historically, banks, and especially French banks, have been major suppliers of credit to commodity trading firms; five banks, three of them French, are reported to provide 75% of the commodity trade finance for Swiss-based trading firms. Deleveraging post-crisis and dollar funding constraints on European/French banks have led to a reduction in bank extensions of commodity credit. This has led to increases in funding costs and reductions in the flexibility of credit arrangements. The impending Basel III rules impose greater capital charges on commodity lending and trade finance generally, which could further reduce bank supply of commodity credit.

Non-bank financing is becoming more important

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2 The earliest such transactions that I am aware of is a securitization of base metals inventories undertaken by Glencore and a securitization of receivables by Vitol in 2003. The term “shadow banking” is used in many different ways. Here is used to mean financial intermediation through the issuance of debt outside the insured banking system.

3 An International Chamber of Commerce study of data from 2005-2009 found that for trade credit generally (which includes not just commodity trade finance), default rates averaged ~0.2%, and that the rate of defaults did not rise appreciably during the period of the crisis. The Offering Circular from a securitization of Trafigura receivables from 2012 reports default rates on the trading firm receivables from November, 2004-February, 2012. Default rates are less than 0.1%, and delinquency rates never exceed 2.4% and are typically less than 0.1%.
Fears of a large reduction in financing available from traditional sources were particularly acute in early-2012, but have abated somewhat. Moreover, according to statements by industry participants, the impact has been minimal for larger, more creditworthy trading firms.\(^4\) Nonetheless, the seismic changes in bank regulation, and the potential for further changes going forward, mean that the traditional commodity trading funding models may not be sustainable. Thus, it is advisable to consider how commodity firms could replace reduced transactional bank funding.

A scaling back of lending by traditional suppliers of commodity finance would create opportunities for new suppliers less severely constrained (e.g., US banks with that can obtain dollar financing more readily, and non-European regional banks looking to invest export-driven dollar flows), but given the relationship-specific nature of bank lending these new suppliers would likely be less efficient than the incumbents. Moreover, global rules like Basel III will impact banks internationally. The reduction in traditional sources of credit would also encourage greater reliance on shadow bank-type funding arrangements.

Any future reductions in traditional forms and sources of commodity finance would be likely to have greater impacts on smaller commodity trading firms than on the larger ones. This would tend to increase concentration in commodity trading activities. Moreover, it should be noted that some of the higher funding costs would be shifted to commodity suppliers (in the form of lower prices) and commodity consumers (in the form of higher prices): that is, higher costs will be associated with higher margins. Given the relative inelasticity of commodity supply and demand, a large fraction of these higher costs will be shifted via prices in this fashion, and the impact on commodity trading volumes will be modest.

One area that deserves further study is the possibility that the reduction in traditional sources of funding for commodity trading could lead to funding squeezes during times of market stress. Traditional commodity finance has been quite flexible and responsive to market conditions. Sharp reductions in the supply of commodity financing from traditional sources would likely result in a decline in the responsiveness of the funding of commodity trading activities to extraordinary conditions in the commodity or financial markets. This could lead to funding squeezes during periods of such conditions that could lead to disruptions in commodity trading: that is, the contraction of traditional sources of commodity finance will likely increase future funding liquidity risk.

C. THE OWNERSHIP OF COMMODITY TRADING FIRMS: PUBLIC VS. PRIVATE

One important aspect of the capital structure of commodity trading firms is the ownership of equity. As noted before, some commodity trading firms are listed firms with publicly traded equity, but others are private firms. Although all small commodity trading firms are private, the relationship between size and equity ownership is complex. Some very large commodity trading firms are private, while other firms that are similar in terms of size and market participation are listed, public firms.

The ABCD firms provide an interesting illustration. Although these firms are broadly comparable in terms of size and breadth and depth of market segment participation, ADM and Bunge are publicly traded, but Cargill and Louis Dreyfus are private. There is thus evidently an element of indeterminacy in the choice of public or private ownership.

This indeterminacy reflects fundamental trade-offs that are particularly challenging for commodity trading firms. A primary advantage of private ownership is the superior alignment of incentives between managers and equity owners. Managers who own small (or no) stake in an enterprise have an incentive to act in ways that benefit themselves, but are harmful to equity holders. For instance, they may consume excessive perquisites, invest in low-returning prestige or empire-building projects, or run ill-advised risks: the managers enjoy the benefits of these activities, but the outside investors bear the costs. In contrast, manager-owners have lower (and perhaps no) incentive to engage in these wasteful behaviors. Moreover, owner-managers have a stronger incentive to monitor their peers, and do so more effectively, than do diffuse outside-equity owners. More generally, since owner-managers more completely internalize the costs and benefits of their decisions than do the managers of public firms, they have a stronger incentive to exert effort, control costs, manage risks, and make value-enhancing investments.

\(^4\) See, for instance, Mercuria CFO Interview: “We Have Seen a Flight to Quality”, Euromoney, 29 October 2013. Mercuria CFO Guillaume Vermersch said, “We have seen a flight to quality. Basically, the good and strong tier 1 credits, such as Mercuria, have had the benefit of additional support and credit lines brought by the same banks that reduced their balance sheets during the crisis. My only explanation for that is that banks have probably ended tier 2 and 3 credit relationships to refocus on tier 1 companies like us.” In interviews with me, Trafigura financial executives expressed similar views.
These benefits do not come for free, however. The main cost of private ownership is inefficient risk bearing. Whereas shareholders of a listed firm can diversify away the idiosyncratic (i.e., firm specific) risks of commodity trading, the owner-managers of a private firm hold a large fraction of their wealth in their enterprise, and hence cannot diversify away these idiosyncratic risks. Thus, idiosyncratic risks are more costly to bear with private ownership than public ownership.

The scale and scope of a commodity trading firm’s operations, and the availability of markets to transfer risk, influence the optimal trade-off between public and private ownership. Private ownership is more viable for a commodity firm that engages in activities where many of the risks outside of management control can be transferred to others via financial contracts. For instance, a firm that engages in activities that primarily involve flat price risks that can be hedged in derivatives markets (e.g., an oil trading firm) or credit risks that can be assumed by banks or insurers or casualty risks that can be insured can transfer these primary risks through financial contracts, leaving the managers to bear only risks that they can more readily control (e.g., operational risks that can be mitigated through close management oversight). Private ownership offers substantial advantages under these circumstances, because the risk bearing benefits of public equity are modest and the incentive alignment benefits of private ownership are large.

In contrast, if a firm is engaged in an activity that involves risks that cannot be transferred by (non-equity) financial contracts, the benefits of public ownership are larger. For instance, the risks of investing in and operating a large mining or energy production project (e.g., the risks of increases in labor costs or construction costs, variability in well depletion rates) cannot be transferred (or are extremely expensive to transfer) using non-equity financial contracts.

Private equity can bear these risks at modest cost if the scale of the activity is sufficiently small. However, large-scale investments (e.g., in a mine or energy exploration and production) require equity investments that are beyond the capacity of a small group of managers to finance. Thus, despite its superior incentive effects, private ownership is incompatible with the operation of large-scale assets with large exposures to risks that cannot be transferred to others by non-equity financial contracts.

This suggests that more traditional “asset light” pure trading activities are efficiently undertaken by private firms, but that more “asset heavy” transformation activities (e.g., mining, crude oil production, refining and processing) must be financed in large part with public equity. This is broadly consistent with observed patterns. For instance, most small, specialized commodity trading firms are privately owned. Even the far larger, but asset light, trading firms, such as Trafìgura and Vitol, are privately owned. This reflects the fact that many of the largest risks incidental to these businesses can be hedged in derivatives, credit, or insurance markets. A company that was, in many ways, similar to Trafìgura and Vitol, but which integrated into more asset-intensive transformation activities (notably mining)—Glencore—shifted from private to public ownership in parallel with this increasing asset intensity.

Notable potential exceptions include large, relatively asset-heavy firms such as Cargill and Louis Dreyfus. Their choice to remain private is likely a consequence of path-dependence. These companies are old (both dating from the mid-19th century), and have accumulated substantial retained earnings during their long history. This historical success has made internal equity finance viable: the companies can finance large projects internally, and diversify risks internally by participating in a wide variety of market segments, thereby reducing the benefits of selling equity to diversified investors.

The increasing asset intensity of commodity trading firms—a trend discussed in Section V—is forcing some of them to evaluate their ownership structure. Trafìgura is a case in point. It is transitioning from a pure trading model to a more fixed asset intensive model, and this is forcing it to adjust its financing accordingly. Heretofore it has decided to remain private, and explicitly invokes the incentive benefits of private ownership to explain its choice. The Trafìgura Annual Report states: “We believe [an employee owned private company] is the best ownership model for our core trading business.” Other firms—most notably Louis Dreyfus—are actively considering going public.

Creative financing methods (e.g., the issuance of perpetual debt) that offer some of the advantages of outside equity (e.g., no rollover risk) but which do not require the firm to go public permit can permit a firm to continue to realize the incentive benefits of private ownership.

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5 I provide data on the asset-heaviness of some important commodity trading firms in Section V below.
ownership: Trafigura and Louis Dreyfus have issued perpetual bonds. Moreover, Trafigura is using hybrid strategies that tap equity financing, but allow it to retain the benefits of private ownership for its core activities. Specifically, the firm has sold off equity in its Puma Energy affiliate, and may pursue a similar strategy with its Impala subsidiary in the future.

Private equity stakes sold to outside groups is another way of transferring risks to non-managers while maintaining the incentive benefits of private ownership. As noted earlier, in recent years a variety of private equity firms have invested in commodity trading ventures.

However, these alternative financing methods are inherently limited (because firm debt capacities are inherently limited due to what economists refer to as "agency problems"). Thus, private ownership for companies not blessed with more than a century of good fortune constrains their future strategic choices. Retention of private ownership necessarily limits the fixed asset intensity of a firm’s transformation activities, and the types of risks it can run.

This further implies that broader market developments that undermine the viability of the pure trading model (such as the greater availability of public information about prices) and that are causing some firms to become more asset intensive will put pressure on the traditional private ownership model. Ownership structure and the nature of firm activities are complementary, and determined jointly. These things cannot be chosen independently.

The form of organization (public vs. private ownership) also has implications for public disclosure, and the amount of information that firms must reveal. In all jurisdictions, private firms like Cargill, Louis Dreyfus, and Trafigura are obligated to keep accounts and records, which must be kept according to accepted accounting principles and standards. Laws regarding what information must be disclosed vary by jurisdiction. In the United States, private companies are not obligated to disclose publicly accounts or other financial information. In the European Union, in contrast, every limited liability company (even private ones) must disclose its balance sheet, income statement, notes to its financial statements, an annual report, and an auditor’s opinion: this information is available from the central register of the country where the firm is incorporated. Therefore, standard financial information about companies registered in EU countries (e.g., Louis Dreyfus, Trafigura) is available, whereas the same is not true for firms incorporated in the US. Thus, although the ability to limit disclosure of financial information may influence the choice between private and public ownership in the United States, it is likely a far less important consideration in Europe.

One final point on disclosure and transparency is warranted. Even privately owned firms in the United States have to provide financial information to their lenders and derivatives counterparties, and private firms anywhere can at their discretion distribute their financial information in ways similar to those used by public companies: Trafigura's recent publication of an annual report, available on its website, is an example of this. With respect to disclosures to government regulators, trading firm positions in listed derivatives are available to exchange staff and government regulators. Moreover, with new reporting regulations under Dodd-Frank in the United States and EMIR in Europe, regulators also have, or will have, access to commodity traders' positions in OTC derivatives.

D. COMMODITY TRADING FIRMS AS FINANCIAL INTERMEDIARIES

Not only is the funding of commodity firms an important aspect of the trading business: so is the fact that trading firms also play a role in financing the commodity trade. Specifically, firms involved in commodity trading often provide various forms of funding to their customers. Thus, these firms supply financial intermediation services to their customers. This intermediation takes the forms of traditional trade credit, and more complex structured transactions that bundle financing, risk management, and marketing services.

The practice of commodity trading firms extending trade credit to those they sell to is a venerable one. These receivables (along with inventories) represent the bulk of the current assets on the balance sheets of trading firms.

An established economics literature provides an explanation for the prevalence of such...
trade financing.\textsuperscript{11} A firm selling a commodity to a customer frequently has better information
on this buyer than would a bank, due to the trading firm’s intimate knowledge of the buyer’s
operations, how it will employ the commodity, market conditions in the buyer’s region, etc.
This permits the trading firm to evaluate creditworthiness better than the bank, and to monitor
the creditor more effectively than the bank.

Furthermore, trade credit is often less subject to opportunistic behavior by the borrower.
One concern about any credit transaction is that the funds lent are diverted for other
than their intended purpose. Cash is more fungible, and hence more easily diverted, than
a commodity used as an input: converting the input to cash would require the buyer to incur
transactions costs, transportation costs, and other expenses. Moreover, such activity is
subject to risk of detection by the commodity trading firm that sold the input on credit,
due to its information on commodity transactions and movements in the markets it serves.
The lower susceptibility to diversion means that trade credit expands the borrowing capacity
of commodity buyers.\textsuperscript{12} Commodities are cheaper, and credit to obtain them more abundant,
when commodity trading firms provide trade credit to their customers.

In addition to traditional trade credit, firms involved in commodity trading (including, notably,
some banks that have physical commodity trading operations) increasingly provide structured
financing to their suppliers and their buyers. A common element of these structures is an
off-take agreement, whereby a trading firm agrees to purchase a contractually specified
quantity of a commodity (e.g., copper concentrate or gasoline) from a producer (e.g., a miner
or refiner) usually at a floating price (benchmark to some market price, plus or minus a
differential). These contracts can vary in duration (e.g., a year, or multiple years) and quantity
(e.g., the fraction of a mine’s output, or its entire production).

One common structure that utilizes an off-take is a prefinancing. Three parties are involved:
A borrower (a producer), a trading company, and a bank. The producer and the trading
company enter into a prepay agreement, and the bank lends money to the producer. Upon
delivery of the commodity from the producer to the trading firm, the trading firm pays (some
or all of) the amounts it owes under the off-take agreement to the bank to repay the loan.
In this arrangement, the bank has no recourse to the trading firm (as long as it performs under
the off-take agreement), and bears all the credit risk associated with the loan to the producer.

Another structure is a commodity prepay. There are two major variants of this structure, but
under each the trading firm and a commodity seller enter into an off-take agreement, funding
is provided to the producer (the prepayment), and the terms of the off-take arrangement are
set to repay the prepaid amount.

In the first variant, the bank provides limited recourse financing to the trading firm, and the
trader assigns the rights under the off-take agreement to the bank as a security. The trading
firm provides funds to the producer, but the bank absorbs the credit risk on the loan, although
in some instances the trading firm may keep a risk participation (e.g., 10%).

In the second variant, the bank provides full recourse financing to the trading firm, which
makes a loan to the producer. In this variant, the trading firm, rather than the bank, bears the
risk that the producer will not repay the prepaid amount. It is common for the trading firm
to offload all or some of this credit risk by entering into an insurance policy. Depending on the
terms of the financing provided by the bank to the trading firm, the bank may be the loss
payee on this insurance policy.

Another common structure offered by commodity trading firms is a tolling arrangement,
whereby a firm supplies a commodity processor (e.g., an oil refiner) with an input (e.g., oil)
and takes ownership of the processed commodity (e.g., heating oil, jet fuel, and gasoline).
The trading firm pays a fixed fee to the processor, pays the market price to acquire the input,
and receives the market price for the refined products.

These structures bundle together multiple goods and services. For instance, in a simple
off-take agreement, the trading firm provides marketing services and hedging (because
the seller is guaranteed a price, and the commodity firm is at risk to price changes over
the life of the contract). A prepay incorporates these elements and a financing element
as well. The seller receives cash upfront, in exchange for a lower stream of payments in the
future: the discount on the sales price is effectively the interest on the prepay amount.

\textsuperscript{11} See, for instance, Bruno Biais and Christian Gollier, Trade Credit and Trade Rationing, 10 Review of Financial Studies (1997)
A tolling agreement bundles input sourcing, output marketing, price risk management, and working capital financing. The working capital element exists because the commodity trading firm has to finance the input from the time it is purchased until it can realize revenue from the sale of the refined good after processing is complete.

The various elements of these bundles could be provided separately. Instead of entering a tolling arrangement, for instance, a refinery could source its own input and market its own output, hedge its input purchases and product sales in the futures markets, and finance its working capital needs by borrowing from a bank. Instead of engaging in a prepay, a miner could market its own output, hedge its price risk on the derivatives markets, and borrow from a financial institution or the capital markets.

However, there are frequently efficiencies that can be captured by bundling these transactional elements into a single structure. By exploiting these efficiencies, firms trading commodities (which, notably, can include banks as well as non-bank trading firms) reduce transactions costs and allocate risks more efficiently, thereby benefiting commodity producers and consumers.

To understand these benefits consider a tolling transaction (which is the structure with the largest number of elements in the bundle). Refineries, power plants, and the like typically need to pay for the inputs they process before they receive payment for their outputs. This creates a need for working capital to finance the timing gap between cash outflows and inflows.

Providing funding for working capital is clearly a traditional banking activity. One way to do this is for a lender to provide a loan or credit facility, and leave the refiner or power plant to acquire inputs and market outputs, and bear and perhaps manage the price and operational risks associated with those activities.

This exposes the lender of the funds to risk: adverse movements in prices could put the refiner or generator into financial distress, and perhaps cause a default. The lender could require the borrower to hedge, but there is a moral hazard: if it does not hedge, or does not do it effectively, the lender bears risk. This undermines the incentive of the borrower to hedge, and hedge well. The lender can monitor, but this is costly, and often imperfect.

The moral hazard problem can be eliminated by passing the risk on to the lender. A prepay agreement or tolling deal does this. These types of deal implicitly provide funding to bridge the outflow-inflow gap, and pass the price risks back to the lender. The lender can manage these risks, and the agency cost in this arrangement is lower: because the lender bears the price risk, there is no moral hazard; it has the incentive to manage the risk; and there is thus no need to monitor. Therefore, bundling price risk management and funding can reduce the cost of funding working capital needs. This is presumably more valuable for lower credit quality refiners and generators.

There are other potential benefits. The lender may have a comparative advantage in managing risk due to specialization and expertise in this function: commodity trading firms and banks have a comparative advantage in risk management. Moreover, they may able to be able to manage risk more cheaply because they run large books: there are economies of scope in risk management. For instance, a lender doing an off-take deal with a refinery is short crude and long products, but it might have a long crude position based on a trade it executed with producer, and might have a short products position as the result of a swap with an airline or heating oil dealer. These natural hedges reduce the amount of trading necessary to manage the risks.

Moreover, trading firms specialize in marketing and logistics, and there are scale economies and scope economies in these activities. It may be cheaper for a big trading firm to provide marketing and logistical services, thereby eliminating the need for the refiner or the power plant to pay the overhead associated with such activities. Smaller, or less sophisticated firms (e.g., a refiner in an emerging market) are likely to benefit most from delegating marketing, logistics, and risk management services to specialist firms that can exploit scale and scope economies.

Thus, there are strong complementarities that make it beneficial to bundle financing, logistical, and marketing activities for some firms that process commodities.